Doc Code: AP.PRE.REQ

PTO/SB/33 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PRE-APPEAL BRIEF REQUEST FOR REVIEW	Docket Number (Optional) 2001145.00120US1	
	Application Number 10/595,128-Conf. #3127	Filed November 15, 2006
	First Named Inventor Anthony R. PRATT et al.	
	Art Unit 2611	Examiner J. B. Corrielus

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).
Note: No more than five (5) pages may be provided.

I am the

- [ ] applicant /inventor.
- [ ] assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)
- [x] attorney or agent of record. Registration number 32,590
- [ ] attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34. _____

/Eric L. Prahl/
Signature

Eric L. Prahl
Typed or printed name

(617) 526-6000
Telephone number

June 22, 2010
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

[x] *Total of 1 forms are submitted.

The examiner rejected claims 1 and 4 under 35 U.S.C. §102(b) as anticipated by U.S. 6,301,306 to McDonald et al. (McDonald). In support of the rejection, the examiner characterized the modulation scheme disclosed by McDonald in the following way:

> Note that McDonald teaches that a QPSK modulation scheme is used to generate the subcarrier modulated signal[.] [As] known in the art a QPSK modulated signal comprises a number of m amplitude levels where m>2, note col. 10, lines 53-54.

The passage in McDonald to which the examiner directs our attention states the following:

> The subcarrier recovery circuit is coupled to an XOR logic circuit 1120, which may be enhanced to provide decoding of multi-level forms of PSK modulation.

The examiner appears to be interpreting the reference to "multi-level forms of PSK" as disclosing more than two amplitude levels. However, that is not what is meant by that statement.

The examiner is misunderstanding the meaning of QPSK (Quadrature Phase Shift Keying) modulation. Contrary to what the examiner appears to believe, QPSK is not a modulation signal that comprises "a number, m, of amplitude levels, where m > 2," as required by the claims.

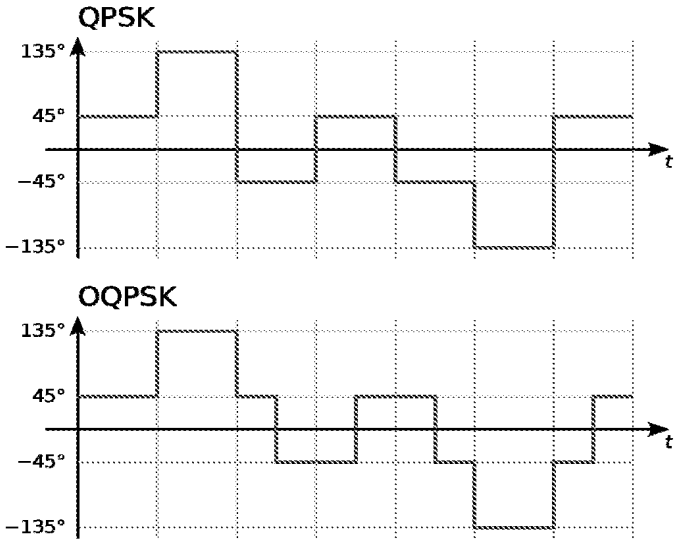
One of ordinary skill in the art understands that QPSK is one example of Phase Shift Keying (PSK) modulation. In general, an M-PSK signal can be expressed for M phases as follows:

$$s_i(t) = \sqrt{\frac{2E_s}{T}} \cos\left[2\pi f_c t + \frac{2\pi(i-1)}{M}\right], \text{ where } i = 1, \ldots, M$$

The carrier term, $2\pi f_c t$, changes only with time in a continuous manner; the phase or phase modulating term, $\frac{2\pi(i-1)}{M}$, changes according to the data and the amplitude term, $\sqrt{\frac{2E_s}{T}}$, remains constant and is unaffected by the modulation.

When M=4, one has QPSK, which uses four phase states. QPSK does not use four amplitude levels; indeed, it does not use more than two amplitude levels, as is required by the claims.

As a further explanation of this point, we previously provided the following diagrams that one skilled in the art typically associates with QPSK and OQPSK (Offset QPSK):



It should be noted that in these diagrams, the y-axis is a measure of the phase of the signal. It is not a measure of the amplitude of the signal. In other words, consistent with our description above, the diagrams disclose multiple phase levels; they do not disclose multiple amplitude levels, as characterized by the examiner.

In both diagrams, the plots are representations of the phase states of a pair of signals each having the amplitudes selected from two possible amplitude levels, namely, $\pm\sqrt{E_s}$. Any given phase state, such as $\pi/4$, is adopted as a representation of a combination of two binary signals, each having amplitudes given by $\sqrt{E_s}$, where E_s is the energy per symbol. In the general case, the amplitudes are $\pm\sqrt{E_s}$.

In response to this argument, the Advisory Action basically reiterated what the examiner had previously argued:

> It is argued that the col. 10, lines 53-54, relates to a demodulator. However, it is noted that such section of the prior art clearly teaches that PSK modulation is a multi-level modulation. In addition, page 7 of applicant's comment clearly shows waveform representation of QPSK signal having multi-level signals, supporting the examiner's rejection.

But again, we must stress that the examiner's understanding is contrary to what is well known to persons of ordinary skill in the art. In particular, phase shift keying (PSK) is a digital modulation scheme that conveys data by changing, or modulating, the phase of the reference signal or carrier wave. It uses a finite number of different phases of the carrier signal to represent the digital data. It is not an amplitude modulation scheme. This definition of PSK can be found in any standard communications text which discusses PSK modulation. In addition, a quick reference to Wikipedia will also readily confirm that to be the meaning of PSK (see http://en.wikipedia.org/wiki/Phase-shift_keying).

We wish to point out that the examiner has provided no support for the examiner's characterization of QPSK modulation. And the examiner has provided no evidence or references contradicting our explanation that QPSK is a phase modulation technique, not an amplitude modulation technique, and that it does not have more that two signal amplitudes. The examiner's characterizations and assertions to the contrary provide an insufficient basis for the rejection.

For at least the reasons stated above, we believe that the claims are in condition for allowance and therefore ask that they be allowed to issue.

Please apply any charges not covered, or any credits, to Deposit Account No. 08-0219, under Order No. 2001145.00120US1 from which the undersigned is authorized to draw.